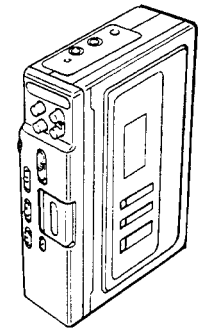
S/M Code No.89-002 DATE OF ISSUE 2/1989-1

AIWA®

HS-F150

SERVICE MANUAL



STEREO CASSETTE RECORDER

• BASIC TAPE MECHANISM : α −1 • TYPE. Y

SPECIFICATIONS

Track arrangement:	4-track, 2-channel, stereo
Frequency range:	40 to 12,500 Hz (NORMAL tape) 40 to 16,000 Hz (METAL tape)
Maximum output:	15mW + 15mW (EIAJ/32Ω) 20mW + 20mW (EIAJ/16Ω)
Power source:	Battery DC 3V LR-6 (SUM-3, AA, R6) × 2 Domestic AC power (using AC adaptor)
Battery life:	• Using manganese batteries (R6, SUM-3, AA) Approx. 5.5 hours (EIAJ, recording mode) Approx. 4.5 hours (EIAJ, 1mW output, playback mode) • Using alkaline batteries (LR-6, AM-3, AA) Approx. 11 hours (EIAJ, recording mode) Approx. 9 hours (EIAJ, 1mW output, playback mode)

- Design and specifications are subject to change without notice.
- Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.
- Dolby and the DD symbol are trademarks of Dolby Laboratories Licensing Corporation.

AIWA Co., Ltd.

Tokyo Japan

Printed in Japan

DISASSEMBLY INSTRUCTIONS

1. Operation Panel and Rear Cabinet Removal
   1) Remove 4 screws (Ⓐ x 3, Ⓑ x 1) and open the cassette lid, then remove the control panel in the direction of arrow ①. (See Figure 1)

   Note 1: The control panel is fitted to the rear cabinet by the hooks. It cannot be removed by pulling it straight up. Remove it gradually in the direction of arrow ① so as not to break the hooks.

   2) Remove 3 screws (Ⓐ' x 1, Ⓒ x 2) and release the hook (see the expanded figure), then remove the rear cabinet in the direction of arrow ②. (See Figure 1)

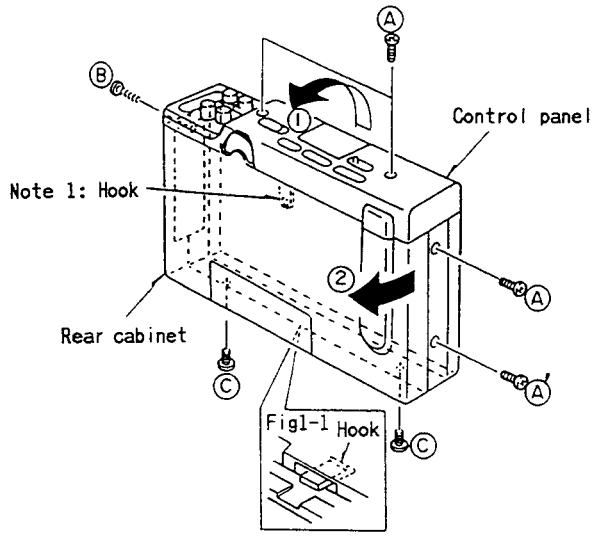


Fig-1

2. Main Circuit Board Removal
   1) Remove 6 screws (Ⓓ x 2, Ⓔ x 2, Ⓕ x 1, Ⓖ x 1).
   2) Remove belt A2 and raise the main circuit board in the direction of the arrow. (See Figure 2)

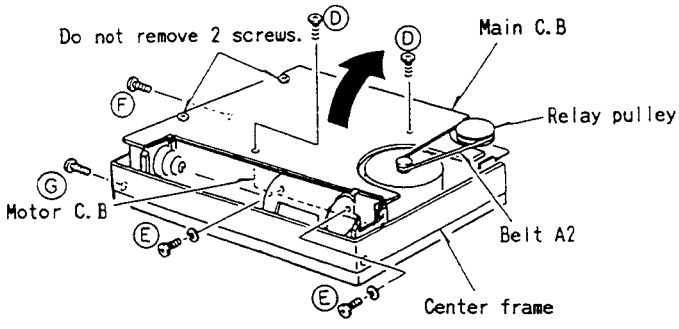


Fig-2

Note 2: Connect the circuit board and mechanism using a shorting clip, etc. for grounding during checking as shown in the figure. (See Figure 3)

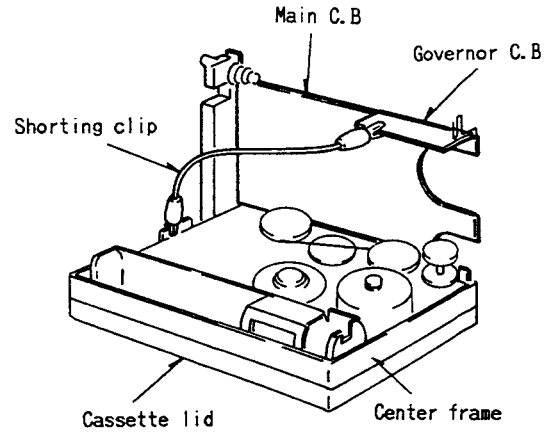
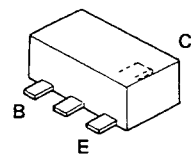
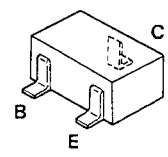


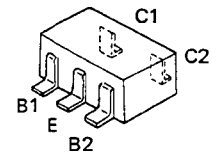
Fig-3



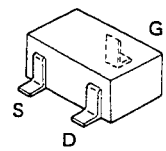
2SA1213



2SC2712
2SD1328
DTC114



FMG4

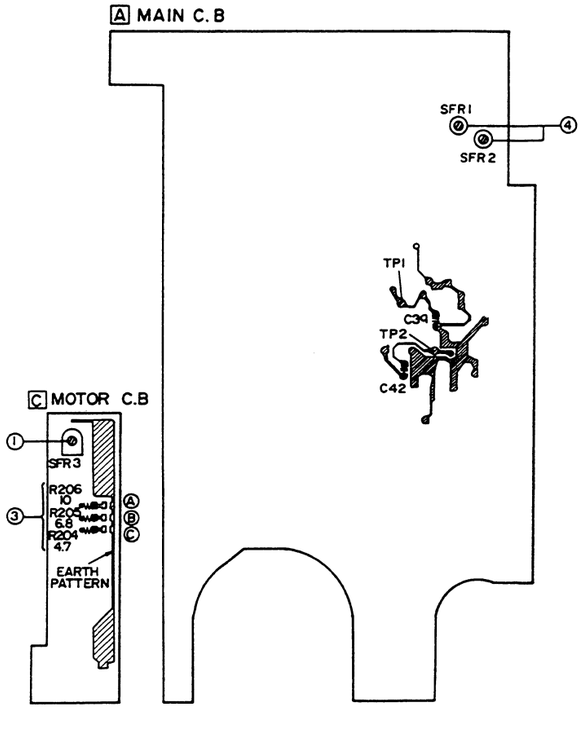


2SK209

ELECTRICAL MAIN PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
=== IC ===		
	87-001-351-019	IC,AN 6612S
	87-001-147-019	IC,BA1102FS
	87-020-505-019	IC,CX20023
	87-001-371-019	IC,LA4533M
=== TRANSISTOR ===		
	89-112-134-019	TRANSISTOR,2SA1213Y
	89-327-124-019	TRANSISTOR,2SC2712(Y)
	89-413-284-019	TRANSISTOR,2SD1328T
	89-502-095-019	TRANSISTOR,2SK209(GR)
	87-026-239-019	TRANSISTOR,DTC114TK
	87-026-299-019	TRANSISTOR,FMG4
=== DIODE ===		
	87-020-339-019	DIODE,CHIP 1SS226
=== MAIN CIRCUIT BOARD SECTION ===		
PCB-A	84-498-602-010	MAIN CIRCUIT BOARD
C1	*87-010-198-019	CAP,CHIP 0.022
C2	*87-010-198-019	CAP,CHIP 0.022
C3	*87-015-822-019	CAP,CHIP 0.022
C4	*87-015-822-019	CAP,CHIP 0.022
C5	*87-010-502-019	CAP,ELECT GAS 100-4
C6	*87-010-587-019	CAP,ELECT GAS 100-2
C7	*87-010-176-019	CAP,CHIP 680P
C8	*87-010-176-019	CAP,CHIP 680P
C9	*87-010-501-019	CAP,ELECT GAS 47-4
C10	*87-010-501-019	CAP,ELECT GAS 47-4
C11	*87-010-198-019	CAP,CHIP 0.022
C12	*87-010-198-019	CAP,CHIP 0.022
C13	*87-010-197-019	CAP,CHIP 0.01
C14	*87-010-197-019	CAP,CHIP 0.01
C15	*87-010-180-019	CAP,CHIP 1500P
C16	*87-010-180-019	CAP,CHIP 1500P
C17	*87-010-498-019	CAP,ELECT GAS 10-16
C18	*87-010-501-019	CAP,ELECT GAS 47-4
C19	*87-010-503-019	CAP,ELECT GAS 220-4
C20	*87-010-501-019	CAP,ELECT GAS 47-4
C21	*87-010-498-019	CAP,ELECT GAS 10-16
C22	*84-439-620-019	CAP,ELECT 470-4
C23	*87-010-452-019	CAP,CHIP 1U
C24	*87-010-452-019	CAP,CHIP 1U
C25	*87-010-170-019	CAP,CHIP 220P
C26	*87-010-180-019	CAP,CHIP 1500P
C27	*87-010-090-019	CAP,TANTALUM 4.7
C28	*87-010-197-019	CAP,CHIP 0.01
C29	*87-010-184-019	CAP,CHIP B 3300P
C30	*87-010-197-019	CAP,CHIP 0.01
C31	*87-012-141-019	CAP,CHIP S 0.22
C32	*87-010-503-019	CAP,ELECT GAS 220-4
C33	*87-010-452-019	CAP,CHIP 1U
C34	*87-010-452-019	CAP,CHIP 1U
C35	*87-010-452-019	CAP,CHIP 1U
C36	*87-010-452-019	CAP,CHIP 1U
C37	*87-010-178-019	CAP,CHIP 1000P
C38	*87-010-178-019	CAP,CHIP 1000P
C39	*87-010-178-019	CAP,CHIP 1000P
C40	*87-010-178-019	CAP,CHIP 1000P
C41	*87-010-193-019	CAP,CHIP 0.033
C42	*87-010-193-019	CAP,CHIP 0.033
C43	*87-010-186-019	CAP,CHIP 4700P
C44	*87-010-186-019	CAP,CHIP 4700P
C45	*87-010-497-019	CAP,ELECT 4.7-35
C46	*87-010-497-019	CAP,ELECT 4.7-35
C47	*87-010-197-019	CAP,CHIP 0.01
C48	*87-010-197-019	CAP,CHIP 0.01
C49	*87-010-193-019	CAP,CHIP 0.033
C50	*87-010-193-019	CAP,CHIP 0.033
C51	*87-010-196-019	CAP,CHIP 0.1
C52	*87-010-196-019	CAP,CHIP 0.1
C53	*87-010-587-019	CAP,ELECT GAS 100-2
C54	*87-010-499-019	CAP,ELECT GAS 22-6.3
C55	*87-012-141-019	CAP,CHIP S 0.22
C56	*87-012-141-019	CAP,CHIP S 0.22
C57	*87-010-588-019	CAP,ELECT GAS 220-2
C58	*87-010-588-019	CAP,ELECT 220-2
C59	*87-010-503-019	CAP,ELECT GAS 220-4
C60	*87-010-452-019	CAP,CHIP 1U
C61	*87-010-497-019	CAP,CHIP ELECT GAS 4.7-35
C62	*87-010-501-019	CAP,ELECT GAS 47-4
C63	*87-010-503-019	CAP,ELECT GAS 220-4
J1	87-049-767-010	JACK 3.5(MIC)
J2	87-049-861-019	JACK 3.5ST 2.5MM BK(PHONES)
J3	87-009-022-019	DC JACK(DC 3V)
L1	*87-007-230-019	COIL,CHIP BIAS OSC
LED1	87-020-520-019	LED TLR-226(OPE/BATT)
S1	87-036-083-019	PUSH SW,CHIP(POWER)
S2	87-036-082-010	SLIDE SW(REC/PB)
S3	87-031-816-019	SLIDE SW(PAUSE)
S4	87-031-816-019	SLIDE SW(DOLBY-NR)
S5	87-031-816-019	SLIDE SW(TAPE)
SFR1	*87-024-079-010	SFR,CHIP 5K
SFR2	*87-024-079-010	SFR,CHIP 5K
VR1	*87-024-123-019	VOLUME 20KA(VOLUME)
=== HEAD CIRCUIT BOARD SECTION ===		
PCB-B	84-468-615-010	HEAD CIRCUIT BOARD
RPH	87-046-315-010	R/P HEAD(W/PCB-B)
S6	86-541-602-019	SLIDE SW(DIRECTION)
TH1	*87-026-256-010	THERMISTOR HT-100
=== MOTOR CIRCUIT BOARD SECTION ===		
PCB-C	84-498-604-019	MOTOR CIRCUIT BOARD
C201	*87-015-933-019	CAP, CHIP TANTALUM 1-10
C202	*87-015-934-019	CAP,CHIP,TANTALUM 2.2-4
R207	*87-022-042-019	RES,CHIP MF 0.5Ω
SFR3	*87-024-076-010	SFR,CHIP 1K
=== G. EQ CIRCUIT BOARD SECTION ===		
	84-479-601-019	G.EQ ASSY(W/PCB-D)
=== MISCELLANEOUS ===		
ECM	87-041-052-019	MIC ECM 60-H
EH	86-541-601-010	E HEAD
M1	87-045-295-019	MOTOR

ADJUSTMENT



1. Tape Speed Adjustment
   Settings : · Test tape : TTA-100(TTA-111S)
   · Adjustment location : SFR3
   Method : Play back the test tape, adjust for 3000Hz.

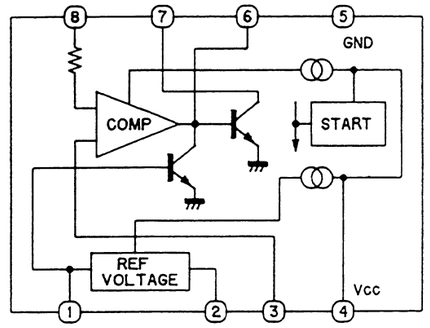
2. Azimuth Adjustment
   Settings : · Test tape : TTS-320(TTA-113B,TCC-152)
   · Adjustment location : Azimuth adjustment screw
   Method : Play back the 8kHz signal of the test tape, and adjust so that the output becomes maximum.

3. Motor Load Adjustment
   Refer to the service technical information REF NO. : SI-88-037-OP.

4. Dolby Level Adjustment
   Settings : · Test tape : TTS-200(TTA-161,TCC-130)
   · Test point : TP1(Lch),TP2(Rch)
   · Adjustment location : SFR1(Lch) SFR2(Rch)
   Method : Adjust SFR1(2) so that the voltage at TP1(2) is 100mV±5mV.

IC BLOCK DIAGRAM

IC, AN6612S



IC DESCRIPTION

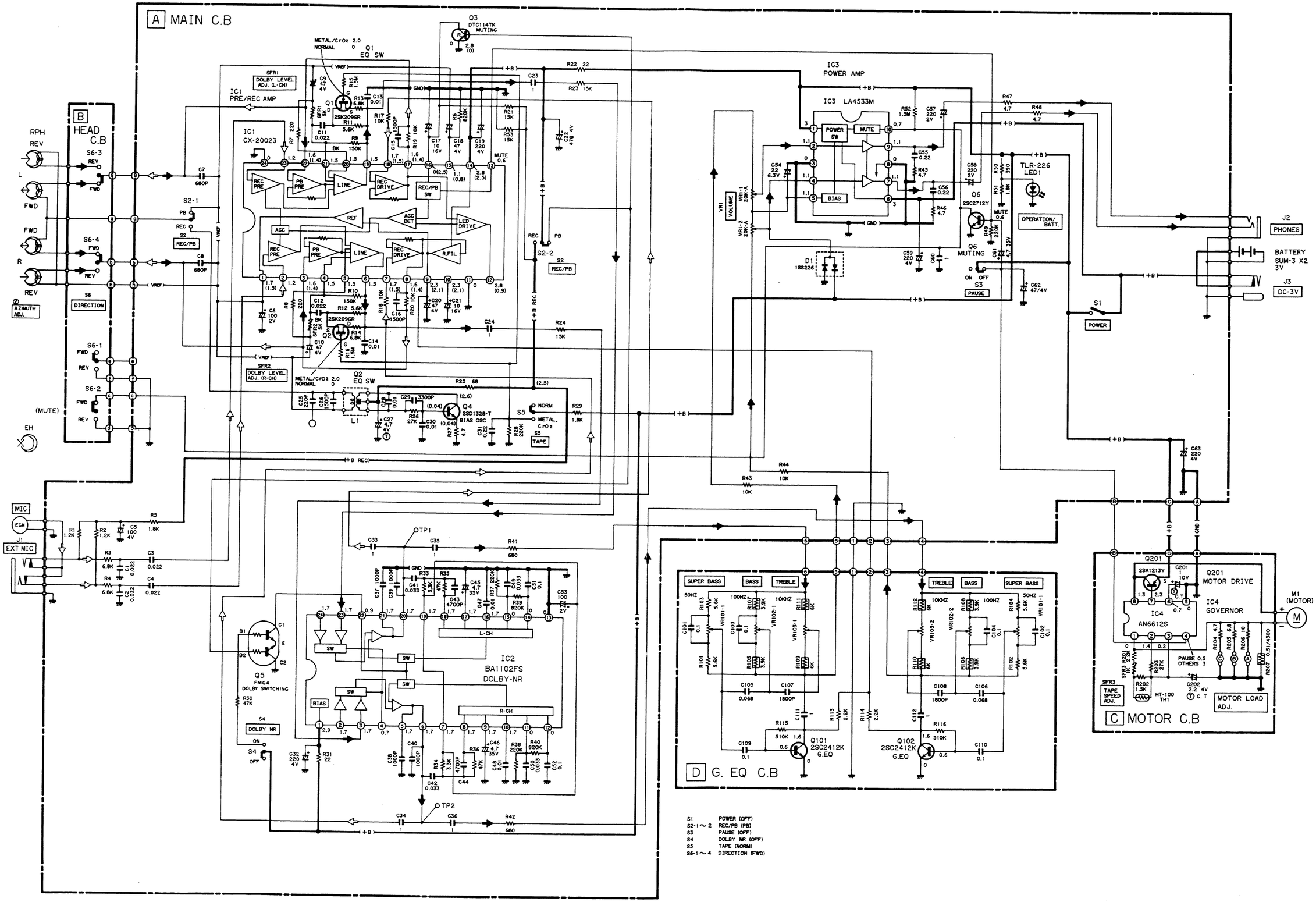
IC, AN6612S

Pin No.	Pin Name	Description
1	VRN	Input terminal for motor current detection
2	VRP	Output terminal for reference voltage
3	VIN	Output terminal for reference voltage control
4	VCC	Power supply terminal
5	GND	GND terminal
6	VB	Terminal for prevention of oscillation
7	VBO	Output terminal for the motor speed of control
8	VM	Input terminal for the motor speed of detection

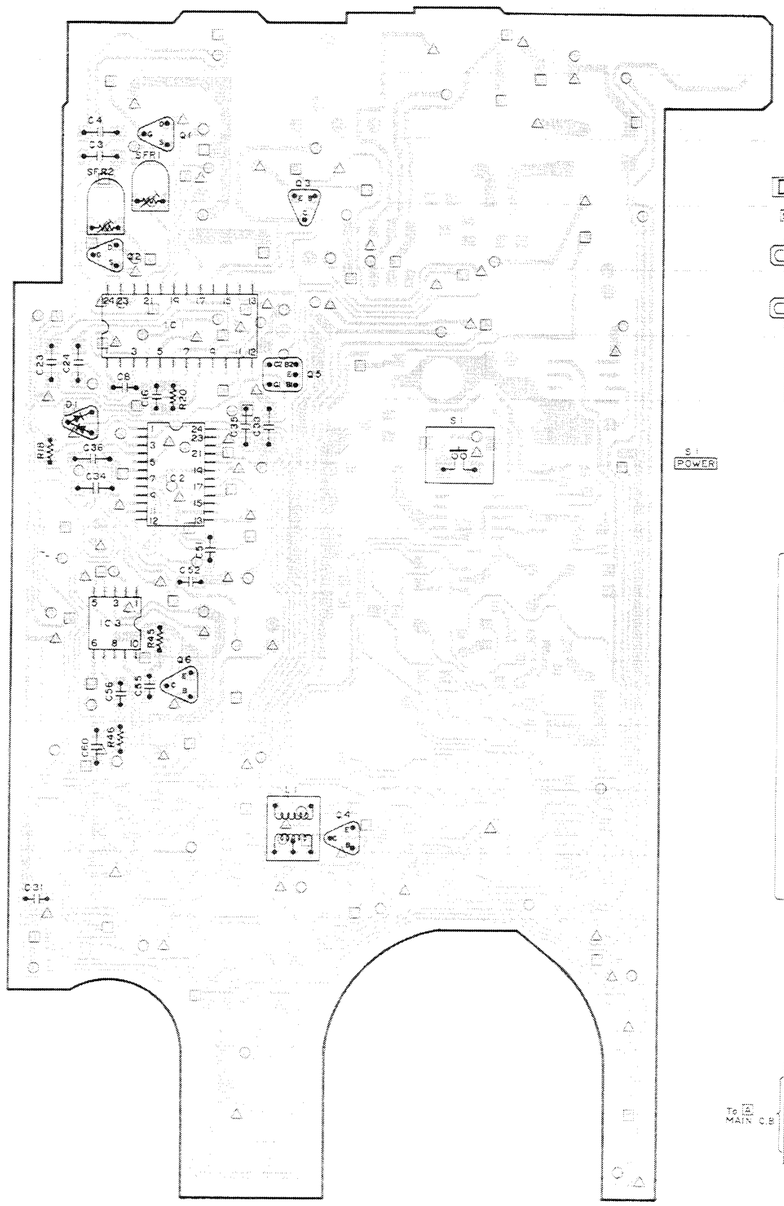
PRACTICAL SERVICE FIGURE

Record bias frequency :	52kHz
Erasing ratio :	More than 48dB
Wow & flutter :	Less than 0.45% (RMS) (FWD)
	Less than 0.48% (RMS) (REV)
Distortion :	Less than 3% (PB)
	Less than 10% (REC)
Signal noise ratio :	47±3dB (PB)
	30±8dB (REC/PB)
Noise level :	Less than 0.2mV (DC MIN. PB)
	Less than 0.2mV (AC MIN. PB)
Pinch roller pressure :	160±10 g
Take up torque :	30^{+10}_{-5} g-cm
FF/rewind torque :	90^{+30}_{-20} g-cm
Back tension :	$2.5^{+1}_{-0.5}$ g-cm (FWD)
	2.5±1g-cm (REV)

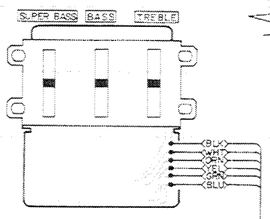
SCHEMATIC DIAGRAM



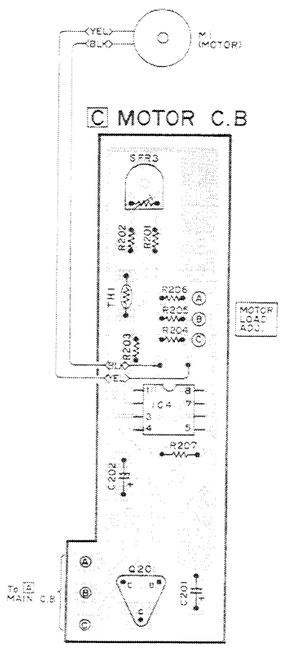
A MAIN C.B



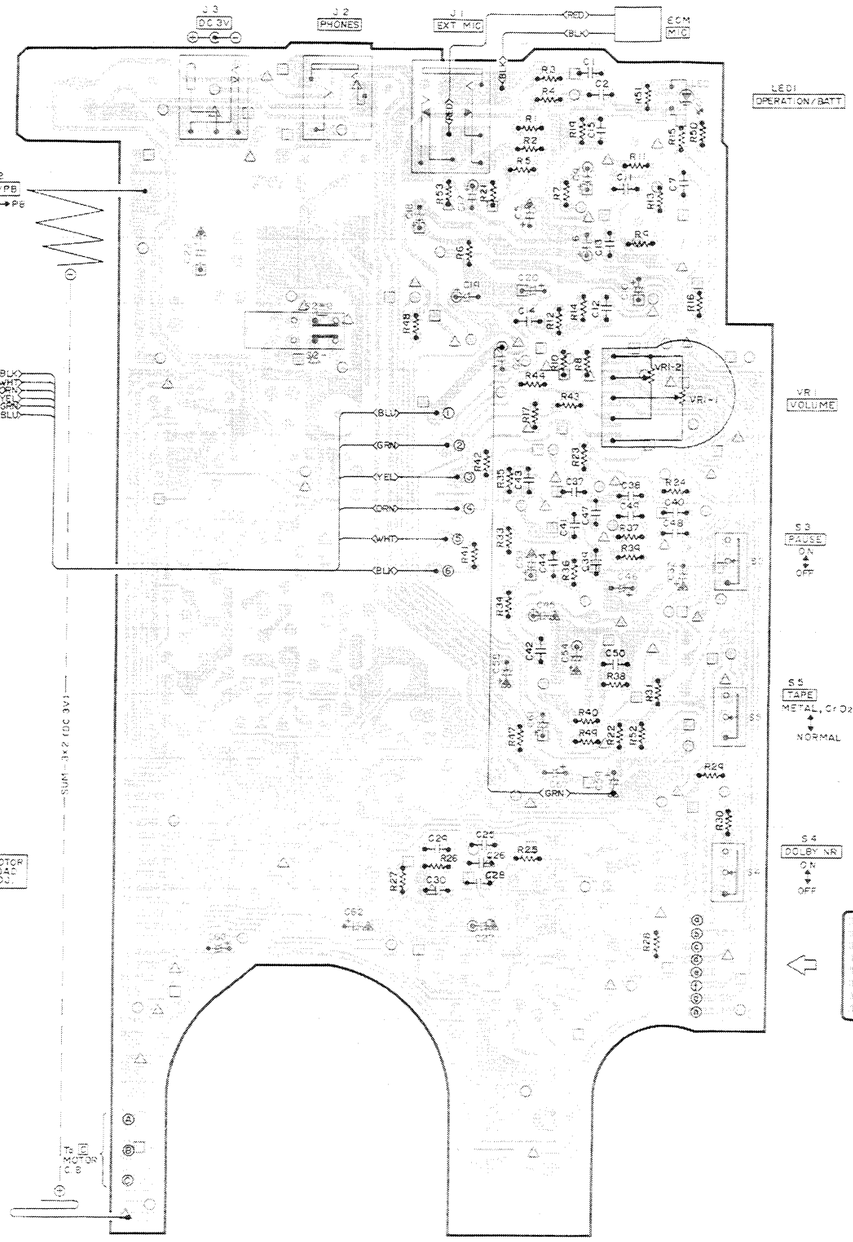
D G.EQ C.B



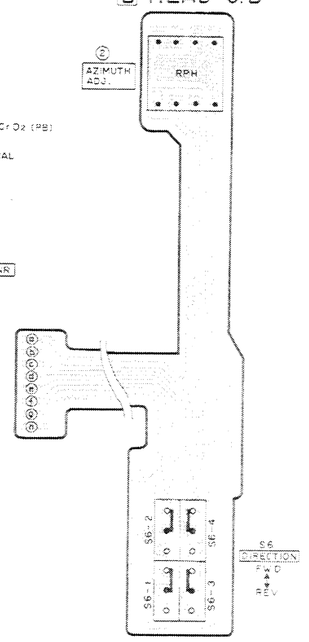
C MOTOR C.B



A MAIN C.B

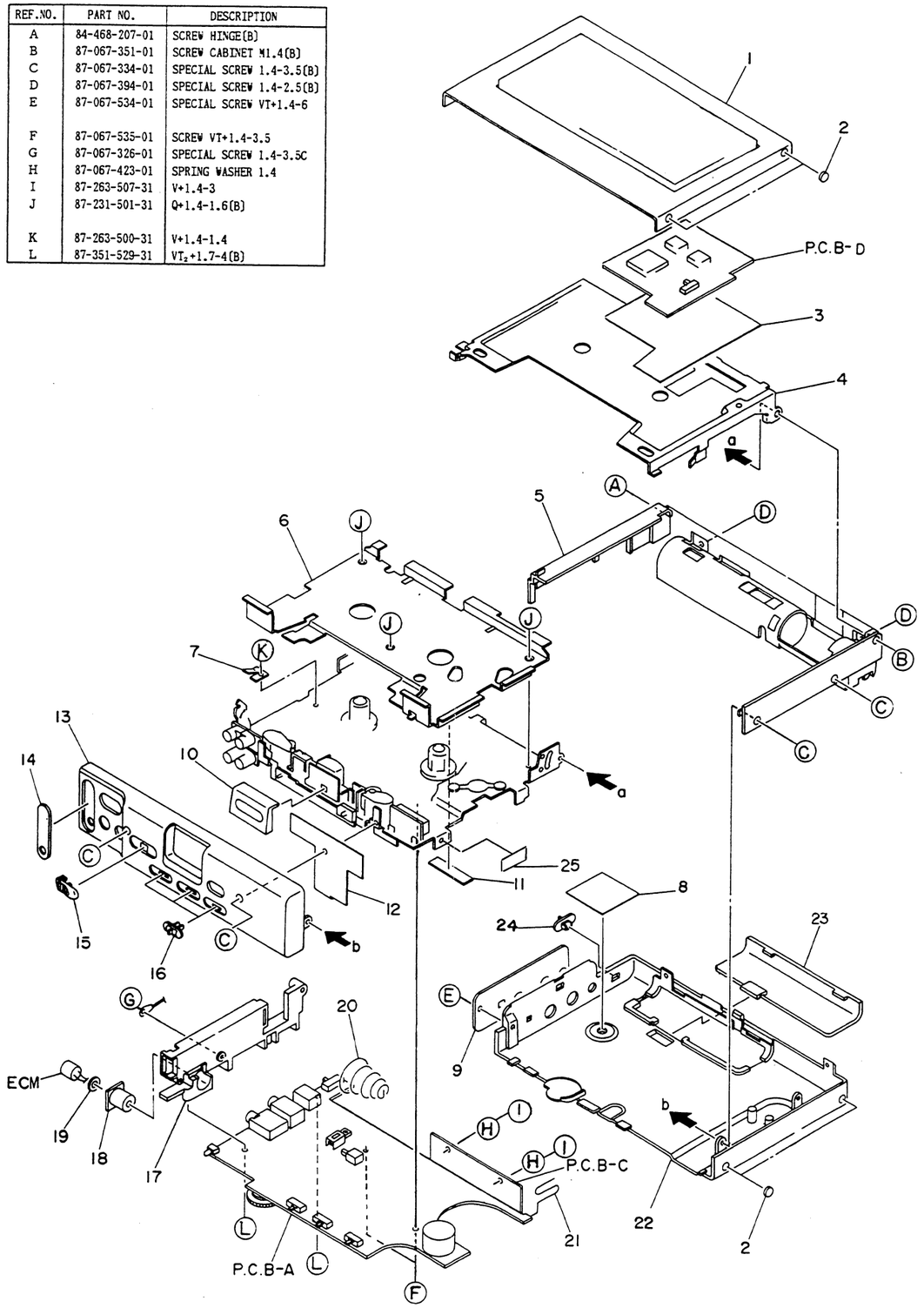


B HEAD C.B



EXPLODED VIEW－1

REF.NO.	PART NO.	DESCRIPTION
A	84-468-207-01	SCREW HINGE(B)
B	87-067-351-01	SCREW CABINET M1.4(B)
C	87-067-334-01	SPECIAL SCREW 1.4-3.5(B)
D	87-067-394-01	SPECIAL SCREW 1.4-2.5(B)
E	87-067-534-01	SPECIAL SCREW VT+1.4-6
F	87-067-535-01	SCREW VT+1.4-3.5
G	87-067-326-01	SPECIAL SCREW 1.4-3.5C
H	87-067-423-01	SPRING WASHER 1.4
I	87-263-507-31	V+1.4-3
J	87-231-501-31	Q+1.4-1.6(B)
K	87-263-500-31	V+1.4-1.4
L	87-351-529-31	VT_2+1.7-4(B)

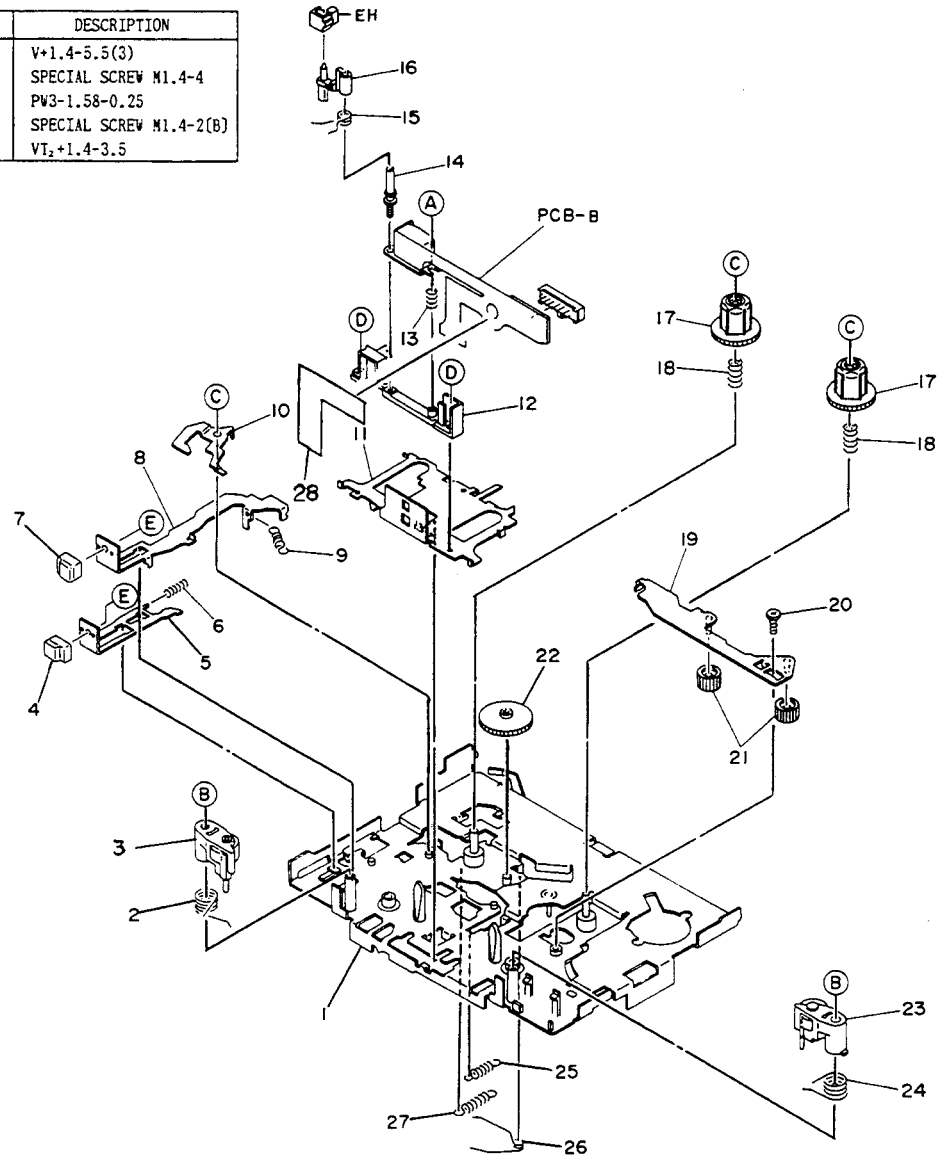


MECHANICAL PARTS LIST

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	1-1	★09-027-696-010	LID CASSETTE ASSY	*	1
	1-2	★84-448-010-019	FOOT,RUBBER		4
	1-3	★84-498-204-019	INSULATION SHEET EQ	*	1
	1-4	★84-498-202-019	HOLDER,CASSETTE ASSY	*	1
	1-5	★84-498-006-019	FRAME CENTER	*	1
	1-6	★84-498-018-019	PLATE,DECORATIVE CASSETTE	*	1
	1-7	★84-463-209-010	P-SPRING,POP UP		1
	1-8	★84-400-609-019	SHEET INSULATION B		1
	1-9	★84-498-011-019	PLATE,SIDE	*	1
	1-10	★84-468-042-019	PUSH-BUTTON,PLAY		1
	1-11	★84-468-212-019	MYLAR 20-6		1
	1-12	★84-468-627-219	SHIELD SHEET HEAD		1
	1-13	★84-498-009-019	PANEL,CONTROL	*	1
	1-14	★84-498-010-019	PLATE,CONTROL	*	1
	1-15	★84-468-051-019	KNOB,SLIDE DIRECTION		1
	1-16	★84-468-045-019	KNOB,SLIDE A		3
	1-17	★84-468-203-019	HOLDER,ANTENNA		1
	1-18	★82-652-218-110	HOLDER,ECM		1
	1-19	★82-690-240-019	RUBBER SPACER 5-2,1-1		1
	1-20	★84-468-210-119	C-SPRING,BATTERY		1
	1-21	★84-468-209-019	BATTERY TERMINAL		1
	1-22	★84-498-012-019	CABINET REAR ASSY	*	1
	1-23	84-498-008-019	LID,BATTERY	*	1
	1-24	★84-498-005-019	SHEET,CABINET	*	1
	1-25	★84-468-252-019	MYLAR SHEET 4-7-0.1		1
		★09-027-697-010	APPEARANCE KIT ASSY	*	1

EXPLODED VIEW－2

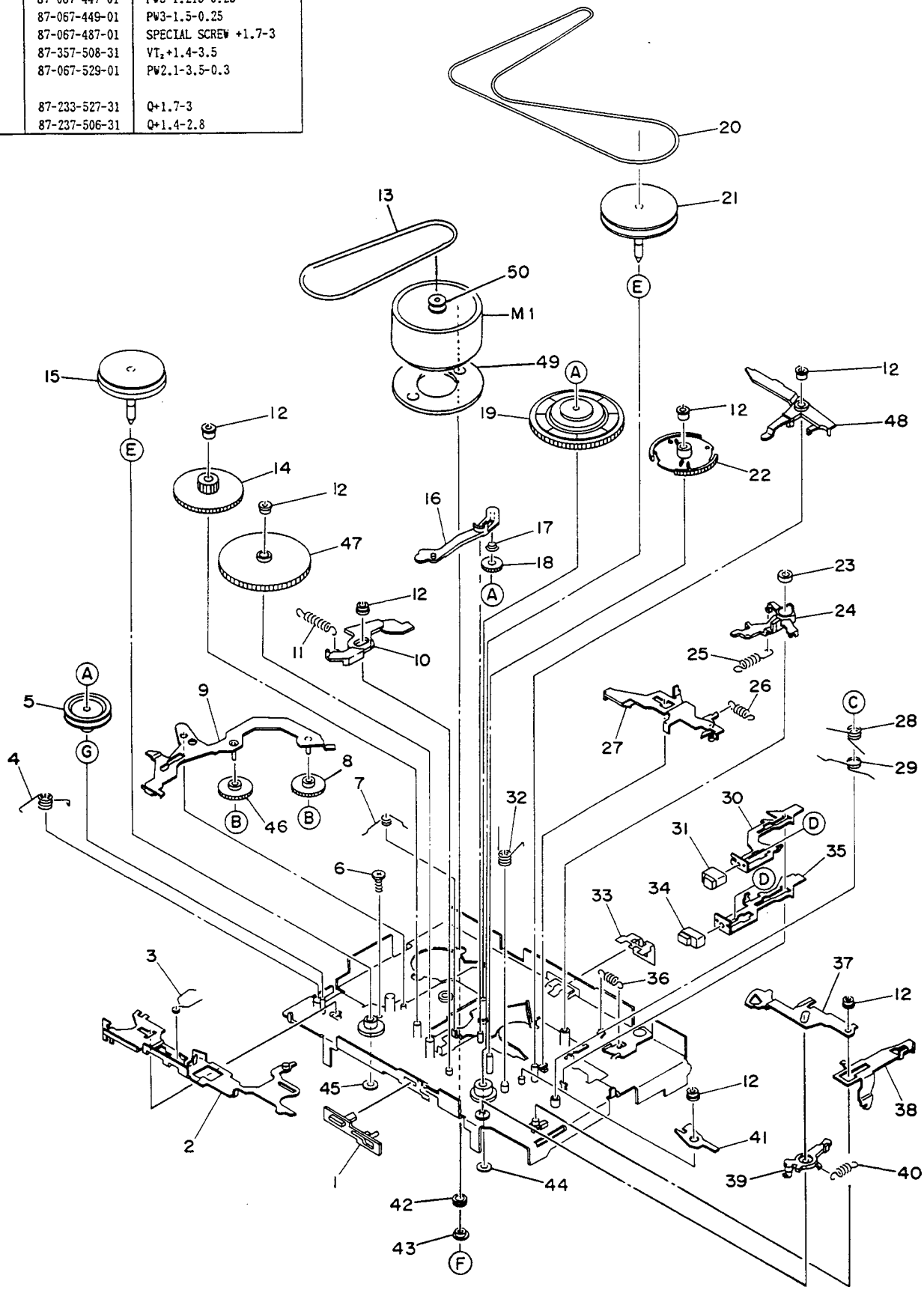
REF.NO.	PART NO.	DESCRIPTION
A	87-268-512-31	V+1.4-5.5(3)
B	87-067-517-01	SPECIAL SCREW M1.4-4
C	87-067-516-01	PW3-1.58-0.25
D	87-067-511-01	SPECIAL SCREW M1.4-2(B)
E	87-357-508-31	VT_2+1.4-3.5



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	2-1	★86-541-201-610	OUTSERT ASSY AR		1
	2-2	★86-541-338-010	T-SPRING,PINCH R P		1
	2-3	86-541-218-110	PINCH LEVER R ASSY		1
	2-4	★84-498-016-019	PUSH-BUTTON,STOP	*	1
	2-5	★86-541-465-010	PLATE,BUTTON STOP		1
	2-6	★86-541-329-010	C-SPRING,STOP		1
	2-7	★84-498-015-019	PUSH-BUTTON,REC	*	1
	2-8	★86-541-266-110	PLATE,BUTTON REC A		1
	2-9	★86-541-312-110	E-SPRING,REC LOCK		1
	2-10	★86-541-277-110	LEVER,REC LOCK		1
	2-11	★86-541-270-610	CHASSIS,SLIDE A		1
	2-12	★86-541-283-110	TAPE GUIDE		1
	2-13	★86-541-318-110	C-SPRING,AZIMUTH		1
	2-14	★86-541-369-019	SCREW EH M1.4		1
	2-15	★86-541-344-010	T-SPRING,EH LEVER		1
	2-16	★86-541-287-010	LEVER EH		1
	2-17	★86-541-236-010	GEAR,REEL PLATFORM		2
	2-18	★86-541-328-010	C-SPRING,REEL PLATFORM		2
	2-19	★86-541-221-210	PLATE FR ASSY		1
	2-20	★86-541-383-010	SCREW FR		1
	2-21	★86-541-244-010	GEAR FR		2
	2-22	★86-541-239-010	GEAR REW		1
	2-23	86-541-216-110	PINCH LEVER F ASSY		1
	2-24	★86-541-314-010	T-SPRING,PINCH F R		1
	2-25	★86-541-331-010	E-SPRING,ACTUATING		1
	2-26	★86-541-347-110	T-SPRING,FR LEVER		1
	2-27	★86-541-336-010	E-SPRING,REC		1
	2-28	★86-541-434-010	MYLAR FLEXIBLE A		1

EXPLODED VIEW—3

REF.NO.	PART NO.	DESCRIPTION
A	87-067-447-01	PW3-1.215-0.25
B	87-067-449-01	PW3-1.5-0.25
C	87-067-487-01	SPECIAL SCREW +1.7-3
D	87-357-508-31	VT_2+1.4-3.5
E	87-067-529-01	PW2.1-3.5-0.3
F	87-233-527-31	Q+1.7-3
G	87-237-506-31	Q+1.4-2.8



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	3-1	*84-498-017-019	KNOB,SLIDE MODE	*	1
	3-2	*86-541-222-310	PLATE,PINCH SELECT ASSY		1
	3-3	*86-541-320-510	T-SPRING,PLAY LEVER		1
	3-4	*86-541-313-010	T-SPRING,PINCH SELECT		1
	3-5	*86-541-231-010	PULLEY RELAY A		1
	3-6	*86-541-435-010	SCREW,PLAY		1
	3-7	*86-541-334-110	T-SPRING,AUTO LEVER		1
	3-8	*86-541-242-210	GEAR,PLAY		1
	3-9	*86-541-219-510	LEVER PLAY ASSY		1
	3-10	*86-541-288-410	LEVER,MODE SELECT		1
	3-11	*86-541-341-010	E-SPRING,MODE CHANGE		1
	3-12	---	COLLAR,PW-BOARD P		7
	3-13	86-541-370-010	BELT A2		1
	3-14	*86-541-240-010	GEAR,SLOW-DOWN		1
	3-15	86-541-401-210	FLYWHEEL ASSY FA		1
	3-16	*86-541-285-110	LEVER,AUTO		1
	3-17	*86-541-325-010	C-SPRING,AUTO GEAR		1
	3-18	*86-541-241-010	GEAR,AUTO		1
	3-19	86-541-206-010	GEAR CLUTCH ASSY		1
	3-20	86-541-368-010	BELT A1		1
	3-21	86-541-402-110	FLYWHEEL ASSY RA		1
	3-22	*86-541-238-410	GEAR,SELECT CAM R		1
	3-23	*84-462-208-110	SPACER,BOSS	HS-J202	1
	3-24	*86-541-292-010	LEVER,REC EJECT AR		1
	3-25	*86-541-297-010	E-SPRING,REC EJECT		1
	3-26	*86-541-332-010	E-SPRING,PLATE LOCK		1
	3-27	*86-541-461-110	PLATE EJECT ASSY A		1
	3-28	*86-541-349-010	T-SPRING,FR BUTTON		1
	3-29	*86-541-339-010	T-SPRING,TRIGGER		1
	3-30	*86-541-467-110	PLATE,BUTTON REW		1
	3-31	*84-498-014-019	PUSH-BUTTON,REW	*	1
	3-32	*86-541-345-110	T-SPRING,SELECT CAM		1
	3-33	*86-541-323-010	P-SPRING,CASSETTE SUPPORT		1
	3-34	*84-498-013-019	PUSH-BUTTON,FF	*	1
	3-35	*86-541-466-010	PLATE,BUTTON FF		1
	3-36	*86-541-330-010	E-SPRING,REC BLOCKING		1
	3-37	*86-541-278-210	LEVER,EH RESET		1
	3-38	*86-541-263-210	PLATE,EJECT		1
	3-39	*86-541-286-010	LEVER,DIRECTION		1
	3-40	*86-541-343-010	E-SPRING,DIRECTION		1
	3-41	*86-541-293-110	LEVER,TRIGGER LOCK		1
	3-42	*86-541-447-010	G CUSHION,MOTOR W		2
	3-43	*86-541-443-010	COLLAR,MOTOR A		2
	3-44	*87-034-739-019	SOMA SHEET 1.63-3.2-0.3 CUT		1
	3-45	*87-067-555-010	SOMA SHEET 3-1.5-0.3 CUT		1
	3-46	*86-541-250-010	GEAR,PLAY H		1
	3-47	*86-541-237-110	GEAR,AUTO CAM		1
	3-48	*86-541-284-210	LEVER,TRIGGER		1
	3-49	*87-038-078-019	SHIELD PLATE		1
	3-50	*86-541-442-010	MOTOR PULLEY A3		1

■ ACCESSORIES/PACKAGE LIST

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	1	*84-498-901-019	INSTRUCTION BOOKLET	*	1
	2	86-340-065-010	EAR PAD (BK)(Y1)		2
	3	87-041-056-010	MIC CM-S20		1
	4	87-048-138-019	HP-09K (Y1)		1
	5	87-048-153-019	HP-M16 (Y,YU)		1
	6	*87-080-025-019	CLIP BELT ASSY		1